

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

REMARKS

In the January 6, 2005 office action, claims 11, 16, 17, 21, 22, 26 and 27 were rejected as being unpatentable over U.S. Patent No. 6,810,783 to Larose. In addition, claims 1-7, 9-11, 16, 17, 21, 22, 26 and 27 were rejected as being unpatentable over Satran (WO 00/02693)

Status of the Claims

Claims 1-7, 9-11, 16, 17, 21, 22, 26 and 27 are pending.

Claims 8, 12-15, 18-20, and 23-25 have been withdrawn from consideration.

With the present amendment, pending claims 1-7, 9-11, 16, 17, 21, 22, 26 and 27 all now recite a "rotary metal cutting tool" to distinguish the present invention from circular wood saws, such as disclosed in the Larose reference.

In addition, independent claims 16 and 21 have been amended to recite that the pocket base is 'tangentially extending' and that the cutting insert has a lower surface "which abuts the tangentially extending pocket base".

Finally, the dependency of claim 26 has been changed from "claim 16" to -claim 1—to eliminate redundancy in the claims.

Rejection of claims 11, 16, 17, 21, 22 and 27¹ under 35 USC 103(a) as being unpatentable over Larose/Amendment to the claims

The rejection of the claims as being unpatentable over Larose is traversed, to the extent that the rejection still applies. As mentioned above, independent claims 16 and 21 have been amended to recite that each insert receiving pocket has a "tangentially extending" pocket base and that the cutting insert has a lower surface "which abuts the tangentially extending pocket base". It is clear that this is not the case in Larose, where the cutting tooth 1 abuts only the front surface 65 of a mounting block 55². It is further submitted that there is no motivation to modify

¹ Claim 26 has been amended to depend on claim 1; since claim 1 was not rejected in view of Larose, claim 26 has been omitted from this list.

² During a telephone call, the Examiner explained to the undersigned Attorney for Applicant that the Examiner considered Larose to disclose an insert receiving pocket with a pocket base and a pocket rear surface. According to the Examiner, Larose's insert receiving pocket is formed between two successive mounting blocks 55, with the front face 65 of the rearward of the two successive mounting blocks 55 serving as the claimed "pocket rear

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

Larose to (a) eliminate the mounting blocks 55, and (b) form an insert receiving pocket with a tangentially extending pocket base and a pocket rear surface directly on the rim 81 of Larose's circular saw 83.

Dependent claims 11, 17, 22 and 27 depend on either claim 11 or 16 and define over the Larose not only for their dependency on their respective base claim and any intervening claim, but also for the totality of features recited therein. In view of all of the foregoing, it is submitted that pending claims 11, 16, 17, 21, 22 and 27 define over Larose.

Rejection of the Claims under 35 USC 103(a) as being unpatentable over Satran

1. Issues for Consideration

Assuming that the amendments to claims 16 and 21 overcome the rejection over Larose, the sole remaining issue is whether claims 1-7, 9-11, 16, 17, 21, 22, 26 and 27 are unpatentable under 35 USC 103(a) for being obvious over of Satran

2. Grouping of Claims

In addressing the rejection over Satran, the claims do not stand or fall together. Instead, the claims are to be grouped as follows:

- Group I: claims 1-6
- Group II: claims 16, 9, 10, 11, 17
- Group III: claims 7
- Group IV: claim 21
- Group V: claim 22
- Group VI: claim 26
- Group VII: claim 27

3. Argument

A. The Satran Reference

surface". The rim 81 of the circular saw 83 between to the two successive mounting blocks 55 serves as a pocket base (which, as seen in the figures of Larose, is not abutted by the tooth 1).

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

Satran, with respect to its Figs. 6A and 6B, discloses a slotting cutter having cutting inserts that are circumferentially staggered along the periphery of a disk-shaped cutter. Such a prior art circumferentially staggered formation is discussed on page 1 of the present application. In such a formation, the cutting inserts alternate along the circumferential direction, one cutting insert protruding on only the left side of the tool body, while the next cutting insert protrudes on the right side of the tool body.

Satran's Figs. 1 to 5a disclose a cutting insert 1 having identical front and rear operative surfaces 2. The front operative surface 2 is bound by identical upper and lower main cutting edges 10 associated with the upper and lower surfaces 6, identical auxiliary cutting edges 12 associated with the side surfaces 8, and four identical corner cutting edges 14 which are rounded and extend between adjacent main cutting edges 10 and auxiliary cutting edges 12, merging continuously therewith. The main cutting edges 10, the auxiliary cutting edges 12 and the corner cutting edges 14 are provided with a land 26 extending therefrom towards respective chip rake surfaces 20, 22 and 24 associated therewith.

The operative front and rear surfaces 2 have lateral portions 40 which extend inwardly away from the auxiliary cutting edges 12 towards a central portion 42 and merge therewith via intermediate portions 44. When the cutting insert 1 is mounted in a cutting tool, the lateral portions 40 of its operative rear surface 2 function as the insert's positioning surfaces. And, as best seen in Fig. 6B, the cutting insert is abutted not only at its operative rear surface 2 at two-spaced apart points, but also at one of its side surfaces 8 by an axial abutment belonging to the pocket of Satran's cutter body.

B. Argument with respect to the claims of Group I (Claims 1-6)

Claim 1 recites, inter alia:

the peripheral side surface comprising four component side surfaces, each component side surface being joined to an adjacent side surface by a side corner, a first opposite pair of the component side surfaces forming front and rear component side surfaces, each component side surface meeting the upper and lower surfaces at upper and lower component cutting edges, respectively, at least outer portions of each upper and lower component cutting edge extending generally inwardly from adjacent side corners and at least outer portions of each component side surface extending generally inwardly from adjacent side corners, (emphasis added).

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

Thus, the invention of claim 1 results in each of four component side surfaces having two component cutting edges, for a total of eight component cutting edges. The insert seen in Fig. 1 of Satran '146 simply does not disclose this feature. As seen in its figures and described in the specification, the side surface 8 in Satran '146 does not meet (upper or lower) surface 6 at a cutting edge. Thus, Satran discloses only four such component cutting edges, two on each end of the cutting insert.

In formulating the rejection of claim 1, the Examiner first conceded that Satran's insert has (two) cutting edges on only two sides, but then (1) took official notice that "it is common for insert to have cutting edges on all four sides", citing prior art references that show cutting inserts with four sides, and (2) argued that "[i]t would have been obvious to one of ordinary skill in the art to have modified Satran by having cutting edges on all four corners³, as is well known, in order to have two additional cutting edges to shift to, thus reducing costs by doubling the life of the insert."

There is no motivation to modify Satran's tool to carry cutting inserts having four component side surfaces, each component side surface meeting at upper and lower surfaces to form a pair of cutting edges.

Applicants do not dispute that, generally speaking, cutting inserts with four identical sides exist in the prior art. However, Applicants submit that there is no reason why one skilled in the art, upon seeing the rotary cutter of Satran with its alternating left- and right-sided pockets (See Figs. 6A & 6B of Satran) and the cutting insert 1', 1" therein, would be motivated to replace Satran's cutting insert 1' or 1" with a cutting insert having four identical sides.

The Satran cutting insert has operative front and rear surfaces that are provided with 'main cutting edges' associated with the top and bottom surfaces, 'auxiliary cutting edges' associated with the side surfaces, and 'corner cutting edges' connecting the main and auxiliary cutting edges. Furthermore, as seen in Fig. 1, the operative front and rear surfaces are each provided with a pair of "lateral portions 40" which function as the insert's positioning surfaces.

³ It is believed that the Examiner meant "sides" and not "corners". Alternatively, it is possible that the Examiner has not appreciated the fact that Satran's cutting insert has two operative surfaces, each provided with main cutting edges, auxiliary cutting edges and corner cutting edges connecting the two.

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

While the Examiner argues that it would be "obvious" to modify Satran's cutting insert to have four identical side surfaces, doing so would require the following very non-obvious putative modifications to the Satran cutting insert and tool:

- (1) All of the cutting insert's four side surfaces would need to be made into "operative surfaces", each having main cutting edges 10, auxiliary cutting edges 12, and corner cutting edges 14 with their corresponding chip rake surfaces 20, 22, 24, respectively, each main cutting edge having two lateral 30 and one central 32 component cutting edge;
- (2) All of the cutting insert's four side surfaces would *also* need to be provided with lateral portions 40 for positioning the cutting insert; and
- (3) the insert pocket would somehow need to be modified to accommodate items (1) & (2).

Even assuming that all these changes are physically possible, there simply is no motivation to make these modifications.

First, the entire purpose of the Satran reference is to disclose and claim the cutting insert described therein. There can be no motivation to modify a prior art reference in a manner that would destroy the invention disclosed therein. And this is exactly what the Examiner suggests as being obvious.

Second, putative modification (1) would mean that adjacent side surfaces would have to share auxiliary cutting edges. Due to wearability considerations, one skilled in the art simply would not design a cutting insert where it was expected that one of the cutting edges would be used a second time after the cutting insert was indexed. This was pointed out in the Declaration⁴ of Amir Satran, but remains unrefuted by the Examiner. (See Satran Declaration at ¶¶ 5-6).

In the Office action mailed January 6, 2005, the Examiner takes "Official Notice that it is common for inserts to have cutting edges on all four sides", and points to U.S. Patent No. 5,718,450 specifically, and vaguely mentions that "dozens of other patents" also disclose this. The fact that four-sided cutting inserts exist in the prior art is completely irrelevant to the point of

⁴ The Satran Declaration was submitted with the Amendment Filed August 20, 2004, as a copy of this is included at attachment A. Amir Satran is not only a co-inventor of the present application, but is also the sole inventor of the Satran reference.

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

¶¶ 5-6 in the Satran Declaration. These Declaration paragraphs point out that if one were to (a) use the putatively modified cutting insert in a first indexed position with an operative first main cutting edge 10 and a pair of operative auxiliary cutting edges 12, and then (b) rotate the cutting insert by 90° to a second indexed position to present an adjacent, second main cutting edge 10, then one of the previously used auxiliary cutting edges 12 would be used a second time. In particular, this would be the auxiliary cutting edge 12 between the adjacent first and second main cutting edges 10. The Satran Declaration, at ¶¶ 5-6, simply points out that one skilled in the art simply would not design a cutting insert such that the same (auxiliary) cutting edge would have to be used after the cutting insert was indexed, due the fact that that (auxiliary) cutting edge would have be worn when the cutting insert was in the first indexed position. In the next office action, the Examiner is kindly asked to specifically address the point raised in ¶¶ 5-6 of the Satran Declaration, and/or point out a cutting insert in which the same auxiliary cutting edge is used in an operationally identical manner in two indexed positions.

Finally, putative modifications (2) & (3) would:

- (a) result in each of the four side surfaces presenting a pair of "lateral portions 40" which function as the insert's positioning surfaces; and
- (b) require modifying Satran's insert receiving pocket so that the insert receiving pocket's lateral abutment (which in Satran's Fig 6B currently abuts the side surface 8 at a single location) would be configured to abut both lateral portions 40 on the "side" of the insert.

However, abutting both lateral portions 40 on the "side" of the insert (as modified) in addition to abutting the two lateral portions 40 on the back of the insert (as is already done), would result in abutting such a cutting insert at a total of four lateral portions, two each on adjacent sides of the putatively modified cutting insert. As stated in the Satran Declaration at ¶¶ 7-8, one skilled in the art would not be motivated to make such a modification due to concerns about achieving consistent, stable seating during cutting operations⁵. (See Satran Declaration at ¶¶ 7-8). The difficulty that arises is one of forming the cutting insert and the insert receiving pocket such that one can have two pairs of abutment points, one pair being orthogonal to the other. If the

⁵ The "three-point" contact disclosed in Satran -- two abutments at the rear and one on the side, is relatively stable. However, making four points of contact simultaneously -- two points of contact in each of two orthogonal directions -- is not.

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

Examiner were to maintain the rejection of claim 1, the Examiner is kindly asked to address this point.

In view of all the foregoing, it is submitted that there is no motivation to modify the Satran cutting insert, as suggested by the Examiner, in his rejection of pending claim 1.

C. Argument with respect to the claims of Group II (Claims 16, 9, 10, 11 & 17)

Independent claim 16 includes the following two features:

(1) each cutting insert has a second opposite pair of its component side surfaces symmetrical with respect to said plane of rotation, and

(2) each cutting insert axially protrudes on both sides of the tool body.

The Satran reference does not disclose either feature (1) or (2). To arrive at the invention of claim 16, one would have to make the following modifications to the slotting cutter 46 seen in Satran's Figs. 6A & 6B⁶:

(a) remove the axial abutment in each pocket of the Satran slotting cutter 46;

(b) center the cutting insert so that a pair of its component side surfaces are symmetrical with respect to the plane of rotation, which would include adjusting the rear surface of the insert pocket which abuts the lateral portions 40, and

(c) enlarge the cutting insert so that it axially protrudes on both sides of the tool body (or alternatively reduce the thickness of the cutter body).

Nothing in Satran would suggest to one skilled in the art to carry out the foregoing. In the January 6, 2005 office action, in rejecting claims 7, 9-11, 16, 17, 21, 22, 26 and 27, the Examiner conceded that "Satran's inserts alternate left and right positions" but went on to take "Official Notice that it is old and well known for the insert to overhang the disk on both sides". The Examiner then proceeded to justify this "Official Notice", citing two prior art patents (Aspinwall and Olson) in which cutting inserts overhang on both sides of a cutter body. Interestingly, however, the Examiner made no effort to argue that it would have been obvious to *modify* Satran as taught in either of these references; the references only serve as some sort of justification for taking "Official Notice".

⁶ In the case of claim 7, these changes would have to be made in addition to the changes described with respect to claim 7.

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

It is submitted that there is no motivation to modify the Satran cutter. It is further submitted that the Examiner has utterly failed to establish a prima facie case of obviousness. All the Examiner has done is mention two prior art patents and imperiously proclaim that there are reasons for modifying Satran. In view of the foregoing, it is submitted that the Examiner has improperly invoked the principle of "Official Notice" and has completely misapplied the "fact" established by taking such Official Notice. It is further submitted that only by impermissible hindsight, upon viewing the invention of this grouping of claims, did the Examiner arrive at the rejection. Accordingly, it is requested that the rejection of this grouping of claims be withdrawn.

D. Argument with respect to the claims of Group III (Claim 7)

Claim 7 depends on claim 1, so all the arguments set forth with respect to the claims of Group I also apply to claim 7.

Claim 7 further recites the following limitations, which were discussed with respect to the claims of Group II:

(1) each cutting insert has a second opposite pair of its component side surfaces symmetrical with respect to said plane of rotation, and

(2) each cutting insert axially protrudes on both sides of the tool body.

These limitations are present in claim 16 (and the claims of Group II). Therefore the arguments set forth with respect to both the claims of Group I & and the claims of Group II all apply to claim 7.

E. Argument with respect to the claims of Group IV (Claim 26)

Claim 26 depends on claim 1, so all the arguments set forth with respect to the claims of Group I also apply to claim 26.

Claim 26 recites, inter alia, "wherein all the cutting inserts are aligned with one another in an axial direction along the axis of rotation, each component side surface of one cutting insert being axially aligned with a corresponding component side surface of each of the other cutting inserts."

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

To arrive at the invention of claim 26 from the slotting cutter 46 seen in Satran's Figs. 6A & 6B, one would have to not only make the modifications discussed with reference to the claims of Group I, but would also have to:

- (a) modify the pockets of Satran's cutter body, and
- (b) axially adjust at least some of the cutting inserts so that each component side surface of a given cutting insert is axially aligned with the corresponding ones on all the other cutting inserts.

This would mean that the cutting inserts no longer alternate along the circumference of Satran's slotting cutter 46. Either all the cutting inserts would face the same side (i.e. as in a 'left' or 'right' handed cutter) or all the cutting inserts would protrude on either side of the cutter body. Nothing in Satran suggests either modification.

Moreover, the Examiner made no effort to argue that it would have been obvious to modify Satran so as to have the component side surfaces all aligned with one another. It is therefore submitted that the Examiner has utterly failed to establish a prima facie case of obviousness and that only by impermissible hindsight, upon viewing the claimed invention of this grouping of claims, could the Examiner have arrived at the rejection. Accordingly, it is requested that the rejection of this grouping of claims also be withdrawn.

F. Argument with respect to the claims of Group V (Claim 27)

Claim 27 depends on claim 16 and so all the arguments set forth with respect to the claims of Group II also apply to claim 27.

Claim 27 further recites "wherein the rear component side surface is the only component side surface abutted by the insert receiving pocket." This feature clearly is not disclosed in Satran, which employs an axial abutment provided on alternating sides of Satran's insert pocket along the periphery, as seen in Satran's Figs. 6A & 6B. This axial abutment is *in addition to* the rear abutment of Satran's pocket.

To arrive at the invention of claim 27 from the slotting cutter 46 seen in Satran's Figs. 6A & 6B, one would have to not only make the modifications discussed with reference to the claims of Group II, but would also have to:

- (a) remove the axial abutment in each of the pockets of Satran's cutter body.

Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

There simply is no motivation to do so. Again, it is submitted that only by impermissible hindsight could the Examiner have arrived at the rejection of this claim, and so it is requested that the rejection of this grouping of claims also be withdrawn.

G. Argument with respect to the claims of Group VI (Claim 21)

Independent claim 21, recites, inter alia, that "all the cutting inserts are symmetric about a common plane of rotation of the tool body."

To arrive at the invention of claim 21 from the slotting cutter 46 seen in Satran's Figs. 6A & 6B, one would have to:

- (a) modify the pockets of Satran's slotting cutter 46 so that one may
- (b) center all the cutting inserts in the axial direction about the same plane of rotation.

It is difficult to see how one could accomplish this while still having the cutting inserts alternate along the circumference of Satran's slotting cutter 46. Thus, as in the case of the claims of Group IV, either all the cutting inserts would face the same side (i.e. as in a 'left' or 'right' handed cutter, yet still being symmetric about a common plane of rotation) or all the cutting inserts would protrude on either side of the cutter body. Nothing in Satran suggests making either such modification.

Moreover, the Examiner made no effort to argue that it would have been obvious to modify Satran so as to have the cutting inserts be symmetric around a common plane of rotation. It is again submitted that the Examiner has failed to establish a prima facie case of obviousness and that only by impermissible hindsight, upon viewing this claim, could the Examiner have arrived at the rejection. Accordingly, it is requested that the rejection of this grouping of claims also be withdrawn.

H. Argument with respect to the claims of Group VII (Claim 22)

Claim 22 depends on claim 21 (i.e. the claim of Group V) and further recites "wherein each cutting inset axially protrudes on both sides of the tool body". Therefore the arguments set forth with respect to both the claims of Group II & Group VI apply to the claims of this group.

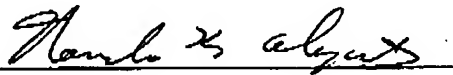
Application No. 10/002,180
Response to Final Office Action mailed January 6, 2005

Reconsideration of the application is requested. Claims 1-7, 9-11, 16, 17, 21, 22, 26 and 27 are believed to be in allowable form and define over the prior art of record. An early notice of allowance is requested so that the application may proceed to issue.

A separate Request for Continued Examination is being concurrent submitted.

Respectfully Submitted,

Date: June 6, 2005



Nanda K. Alapati (Reg. No. 39,893)
Customer ID No. 26158
Phone: 703-394-2216